Reg. No. \_\_\_\_\_\_\_\_\_\_\_\_\_

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**End Semester Examination – Nov / Dec – 2019**

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| **Code :** | **18CS2006** | **Duration :** | **3hrs** |
| **Sub. Name :** | **DATA STRUCTURE AND ALGORITHMS** | **Max. Marks :** | **100** |

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| **Q. No.** | | **Questions** | **Course Outcome** | **Marks** |
| **PART – A (10X1 = 10 MARKS)** | | | | |
| 1. | | What is the time complexity of an algorithm to find whether the given number is prime or not? | CO1 | 1 |
| 2. | | Give one example for logarithmic running time algorithm. | CO3 | 1 |
| 3. | | List any two applications of Stack. | CO3 | 1 |
| 4. | | Define recursion. | CO2 | 1 |
| 5. | | Write the advantage of doubly linked list over singly linked list. | CO2 | 1 |
| 6. | | What do you mean by space efficiency? | CO4 | 1 |
| 7. | | Give one advantage of using hashing. | CO5 | 1 |
| 8. | | What is the time complexity of Insertion sort when it is already in sorted order? | CO4 | 1 |
| 9. | | Give the worst case time complexity of Merge and Quick sort. | CO5 | 1 |
| 10. | | What is the outcome of Quick sort after I pass? | CO6 | 1 |
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| **PART – B (6 X 3 = 18 MARKS)** | | | | |
| 11. | Explain any two asymptotic notations with an example. | | CO4 | 3 |
| 12. | Compare stack and queue. | | CO2 | 3 |
| 13. | Write an algorithm to create a single node in singly linked list and explain. | | CO3 | 3 |
| 14. | Write general plan for analyzing time efficiency of non recursive algorithms. | | CO4 | 3 |
| 15. | Write a routine to do sequential search and analyze the same. | | CO5 | 3 |
| 16. | What is divide and conquer method? Give one example. | | CO6 | 3 |

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| **PART – C (6 X 12 = 72 MARKS)**  **(Answer any five Questions from Q.no 17 to 23. Q.No 24 is a Compulsory Question)** | | | | | | |
| 17. | a. | Write a short note on analysis framework. | CO4 | | 6 | |
| b. | Draw the flow graph for algorithm design and analysis process. | CO4 | | 6 | |
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| 18. | a. | Write a routine to do any two basic operations on Stack. Write one application of stack. | CO2 | | 8 | |
|  | b. | Write a note on Circular Queue. | CO2 | | 4 | |
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| 19. | a. | Write an algorithm to create doubly linked list. Insert a node at all positions (front, mid and end). | CO3 | | 8 | |
| b. | Write a routine to search an item in a circular linked list. | CO3 | | 4 | |
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| 20. |  | Write about linked stack and queues. | CO3 | | 12 | |
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| 21. | a. | Write an algorithm to find whether all the elements in a given array are distinct and analyze the same. | CO4 | | 6 | |
| b. | Write an algorithm to compute N Fibonacci numbers and analyze the same. | CO4 | | 6 | |
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| 22. | a. | Write about algorithm visualization and explain the advantages of it. | CO5 | | 6 | |
| b. | Sort N numbers using bubble sort. | CO5 | | 6 | |
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| 23. |  | Explain open addressing techniques in hashing. | CO5 | | 12 | |
| **Compulsory:** | | | | | | |
| 24. | a. | Write an algorithm to do quick sort and explain with an example. | | CO6 | | 8 |
| b. | Write a routine to search an item using binary search. | | CO6 | | 4 |
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